

What is claimed is:

1. A blood sugar level measuring apparatus comprising:

- a heat amount measurement portion for measuring a plurality of temperatures derived from a body surface and obtaining information used for calculating the amount of heat transferred by convection and the amount of heat transferred by radiation, both related to the dissipation of heat from said body surface;

- an oxygen amount measuring portion for obtaining information about blood oxygen amount;

- a storage portion for storing a relationship between parameters corresponding to said plurality of temperatures and blood oxygen amount and blood sugar levels;

- a calculating portion which converts a plurality of measurement values fed from said heat amount measuring portion and said oxygen amount measurement portion into said parameters, and computes a blood sugar level by applying said parameters to said relationship stored in said storage portion; and

- a display portion for displaying the blood sugar level calculated by said calculating portion, wherein:

- said oxygen amount measurement portion includes a blood flow volume measurement portion for obtaining information about blood flow volume, and an optical measurement portion for obtaining blood hemoglobin concentration and hemoglobin oxygen saturation, wherein said blood flow volume measurement portion includes:

- a body-surface contact portion;

- a guide for guiding the subject to said body-surface contact portion;

- an adjacent temperature detector disposed adjacent to said body-surface contact portion;

- an indirect temperature detector for detecting the temperature at a position spaced apart from said body-surface contact portion; and

a heat conducting member connecting said body-surface contact portion and said indirect temperature detector.

2. The blood sugar level measuring apparatus according to claim 1, wherein said guide is disposed such that it surrounds said body-surface contact portion.

3. The blood sugar level measuring apparatus according to claim 1, wherein said guide comprises a stopper for positioning a analyte.

4. The blood sugar level measuring apparatus according to claim 3, wherein said stopper comprises a first stopper for defining the position of the tip of said analyte, and a second and a third stopper for defining the position of said analyte in the direction along the width thereof.

5. The blood sugar level measuring apparatus according to claim 3, wherein the position of said stopper is variable.

6. The blood sugar level measuring apparatus according to claim 1, wherein said guide has a depression that conforms to the shape of said analyte.

7. A blood sugar level measuring apparatus comprising:

an ambient temperature measuring device for measuring ambient temperature;

a body-surface contact portion to which a body surface is brought into contact;

a guide for guiding an analyte to said body-surface contact portion;

an adjacent temperature detector disposed adjacent to said body-surface contact portion;

a radiant heat detector for measuring radiant heat from said body surface;

a heat conducting member disposed in contact with said body-surface contact portion;

an indirect temperature detector disposed at a position that is adjacent to said heat conducting member and that is spaced apart from said body-surface contact portion, said indirect temperature detector measuring temperature at the position spaced apart from said body-surface contact portion;

a light source for irradiating said body-surface contact portion light with at least two different wavelengths;

a light detector for detecting reflected light produced as said light is reflected by said body surface;

a converter for converting outputs from said adjacent temperature detector, said indirect temperature detector, said ambient temperature detector, said radiant temperature detector and said light detector, into parameters;

a calculating portion in which a relationship between said parameters and blood sugar levels is stored in advance, and which calculates a blood sugar level by applying said parameters to said relationship; and

a display for displaying the blood sugar level outputted from said calculating portion.

8. The blood sugar level measuring apparatus according to claim 7, wherein said guide is disposed such that it surrounds said body-surface contact portion.

9. The blood sugar level measuring apparatus according to claim 7, wherein said guide comprises a stopper for positioning a analyte.

10. The blood sugar level measuring apparatus according to claim 9, wherein said stopper comprises a first stopper for defining the position of the tip of said analyte, and a second and a third stopper for defining the position of said analyte in the direction along the width thereof.

11. The blood sugar level measuring apparatus according to claim 9, wherein the position of said stopper is variable.

12. The blood sugar level measuring apparatus according to claim 9, wherein said stopper has a thermal conductivity of not more than 0.1 W/m·k.

13. The blood sugar level measuring apparatus according to claim 7, wherein said guide has a depression that conforms to the shape of said analyte.

14. A blood sugar level measuring apparatus comprising:

- an ambient temperature measuring device for measuring ambient temperature;

- a body-surface contact portion to which a body surface is brought into contact;

- a guide for guiding an analyte to said body-surface contact portion;

- an adjacent temperature detector disposed adjacent to said body-surface contact portion;

- a radiant heat detector for measuring radiant heat from said body surface;

- a heat conducting member disposed in contact with said body-surface contact portion;

- an indirect temperature detector disposed at a position that is adjacent to said heat conducting member and that is spaced apart from said body-surface contact portion, said indirect temperature detector measuring temperature at the position spaced apart from said body-surface contact portion;

- a storage portion where information about blood hemoglobin concentration and blood hemoglobin oxygen saturation is stored;

- a converter for converting outputs from said adjacent temperature detector, said indirect temperature detector, said ambient temperature measuring device and

said radiant heat detector, into a plurality of parameters;

a calculating portion in which a relationship between said parameters and blood sugar levels is stored in advance, said calculating portion including a processing portion for calculating a blood sugar level by applying said parameters to said relationship; and

a display for displaying the blood sugar level outputted from said calculating portion.

15. The blood sugar level measuring apparatus according to claim 14, wherein said guide is disposed such that it surrounds said body-surface contact portion.

16. The blood sugar level measuring apparatus according to claim 14, wherein said guide comprises a stopper for positioning a analyte.

17. The blood sugar level measuring apparatus according to claim 16, wherein said stopper comprises a first stopper for defining the position of the tip of said analyte, and a second and a third stopper for defining the position of said analyte in the direction along the width thereof.

18. The blood sugar level measuring apparatus according to claim 16, wherein the position of said stopper is variable.

19. The blood sugar level measuring apparatus according to claim 16, wherein said stopper has a thermal conductivity of not more than $0.1 \text{ W/m}\cdot\text{k}$.

20. The blood sugar level measuring apparatus according to claim 14, wherein said guide has a depression that conforms to the shape of said analyte.